3.3 Series

Name _____ Date _____ Period _____

Write each sum using summation notation, assuming the suggested pattern continues.

1. $-7-1+5+11+...+53$

2. $2+5+8+11+...+29$

3. $1+4+9+...+(n+1)^2$

4. $1+8+27+...+(n+1)^3$

5. $6-12+24-48+...$

6. $5-15+45-135+...$

Find the sum of the arithmetic sequence.

7. $-7,-3,1,5,9,13$

8. $-8,-1,6,13,20,27$

9. $1,2,3,4,...,80$

10. $2,4,6,8,...,70$

11. $117,110,103,...,33$

12. $111,108,105,...,27$

Find the sum of the geometric sequence.

13. $3,6,12,...,12,288$

14. $5,15,45,...,98,415$

15. $42,7,\frac{7}{6},...,42\left(\frac{1}{6}\right)^8$

16. $42,-7,\frac{7}{6},...,42\left(-\frac{1}{6}\right)^9$

Find the sum of the first *n* terms of the sequence. The sequence is either arithmetic or geometric.

17. $2, 5, 8, \ldots; n = 10$

18. $14, 8, 2, \ldots; n = 9$

19. $6, -3, \frac{3}{2}, \frac{-3}{4}, \ldots; n = 11$

20. $4, -2, 1, \frac{-1}{2}, \ldots; n = 12$

21. $-1, 11, -121, \ldots; n = 9$

22. $-2, 24, -288, \ldots; n = 8$

23. Find the first six partial sums of the following infinite series. If the sums have a finite limit, write "convergent". If not, write "divergent".

a) $0.3 + 0.03 + 0.003 + 0.0003 + \ldots$

b) $1 - 2 + 3 - 4 + 5 - 6 \ldots$

24. Find the first six partial sums of the following infinite series. If the sums have a finite limit, write "convergent". If not, write "divergent".

a) $- 2 + 2 - 2 + 2 - 2 + \ldots$

b) $1 - 0.7 - 0.07 - 0.007 - 0.0007 - \ldots$

Determine whether the infinite geometric series converges. If it does, find its sum.

25. $6 + 3 + \frac{3}{2} + \frac{3}{4} + \ldots$

26. $4 + \frac{4}{3} + \frac{4}{9} + \frac{4}{27} + \ldots$

27. $\frac{1}{64} + \frac{1}{32} + \frac{1}{16} + \frac{1}{8} + \ldots$

28. $\frac{1}{48} + \frac{1}{16} + \frac{3}{16} + \frac{9}{16} + \ldots$

29. $\sum_{k=1}^{\infty} 3\left(\frac{1}{4}\right)^k$

30. $\sum_{j=1}^{\infty} 5\left(\frac{2}{3}\right)^j$